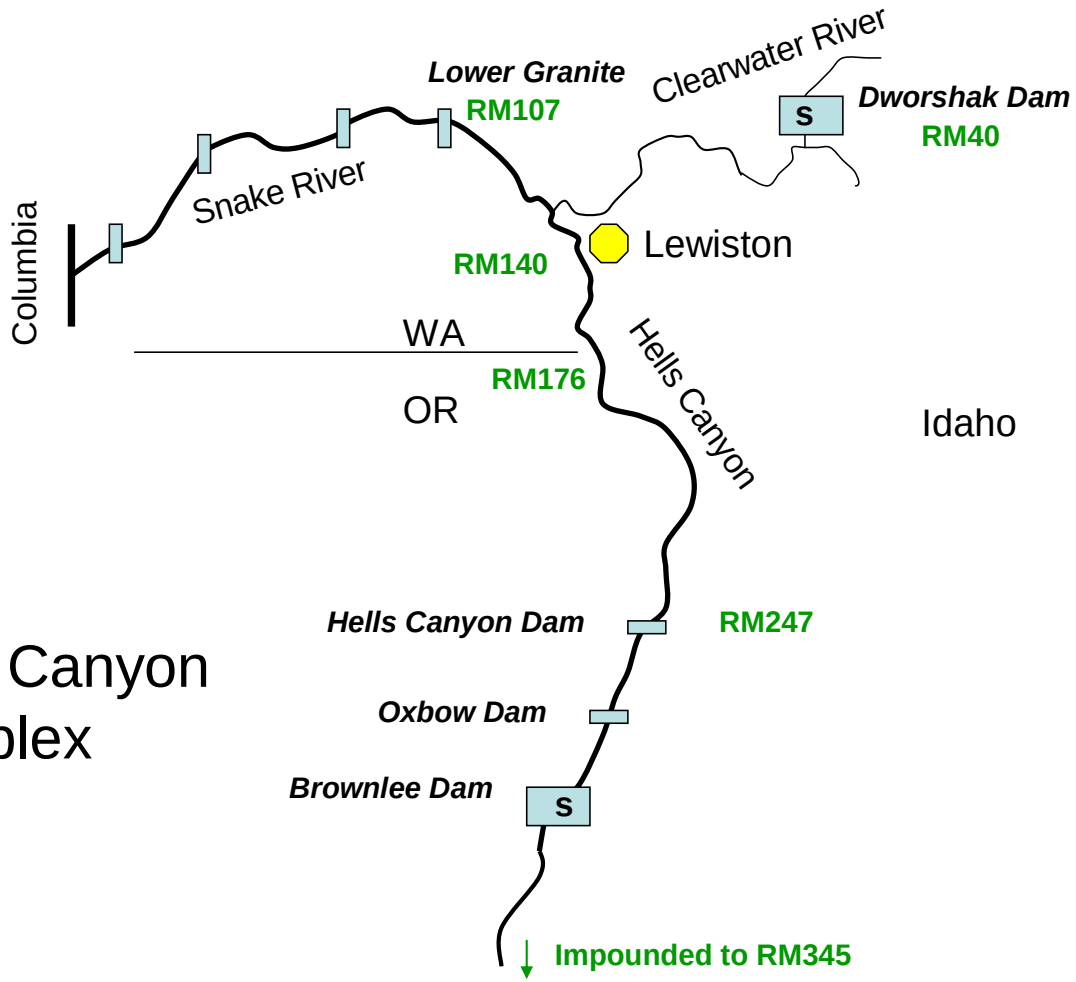
# EPA's Upcoming CWA Action on Idaho's Site Specific Criterion for Temperature for the Snake River

April 23, 2019

# Hells Canyon Complex




Hells Canyon Complex

# Background

- On June 8, 2012, Idaho submitted a revised site specific criterion for the Snake river to EPA. EPA must take action to approve or disapprove the SSC.

  *–We have not taken action on the SSC pursuant to CWA Section 303(c) and implementing regulations at 40 CFR Section 131.21.*

- Below is the revised language:

***SNAKE RIVER, SUBSECTION 130.01, HUC 17060101, UNIT S1, S2, AND S3; SITE SPECIFIC CRITERIA FOR WATER TEMPERATURE.*** *~~A maximum weekly maximum temperature of thirteen degrees C (13C) to protect fall chinook spawning and incubation applies from October 23rd through April 15th in the Snake River from Hell's Canyon Dam to the Salmon River.~~ Weekly maximum temperatures (WMT) are regulated to protect fall chinook spawning and incubation in the Snake River from Hell's Canyon Dam to the confluence with the Salmon River from October 23 through April 15. Because the WMT is a lagged seven (7) day average, the first WMT is not applicable until the seventh day of this time period, or October 29. A WMT is calculated for each day after October 29 based upon the daily maximum temperature for that day and the prior six (6) days. From October 29 through November 6, the WMT must not exceed fourteen point five degrees C (14.5°C). From November 7 through April 15, the WMT must not exceed thirteen degrees C (13°C).*

# What is different in Idaho's revised SSC?

- The weekly maximum temperature from October 29 to November 6th would be 14.5C
  - (November 7th-April 15th still 13C)
- October 23rd to October 29th, is stated to be the first averaging period for the lagged 7-day average daily maximum, such that 14.5C is not "applicable" until October 29th
- Slight change from a "maximum of the weekly maximum temperatures" to a "weekly maximum temperature"
- Note – Oregon's effective criterion is 13C for October 23-April 15 for the Snake River below HC Complex to the border with WA.

# Status of EPA's Review and Pending Action

- When we last spoke with the Council on this topic, we were reviewing the SSC. The review was put on hold for several years while the 401 certification for the Hells Canyon Complex progressed.
  - Currently, the states have issued draft certifications.
  - Public comment period for ID and OR ended in February 2019
  - States plan to issue certifications by June 14, 2019
- Litigation brought by Idaho Power Company and joined by the State of Idaho – filed in 2018
  - Claim of mandatory duty for EPA to take CWA action on the submission
- A stay for the litigation is in place pending the completion of ESA consultation, and EPA's review and action

# Scientific Basis and Level of Protection: NOAA's Fall Chinook Recovery Plan (November 2017), Temperature Impacts and Summary

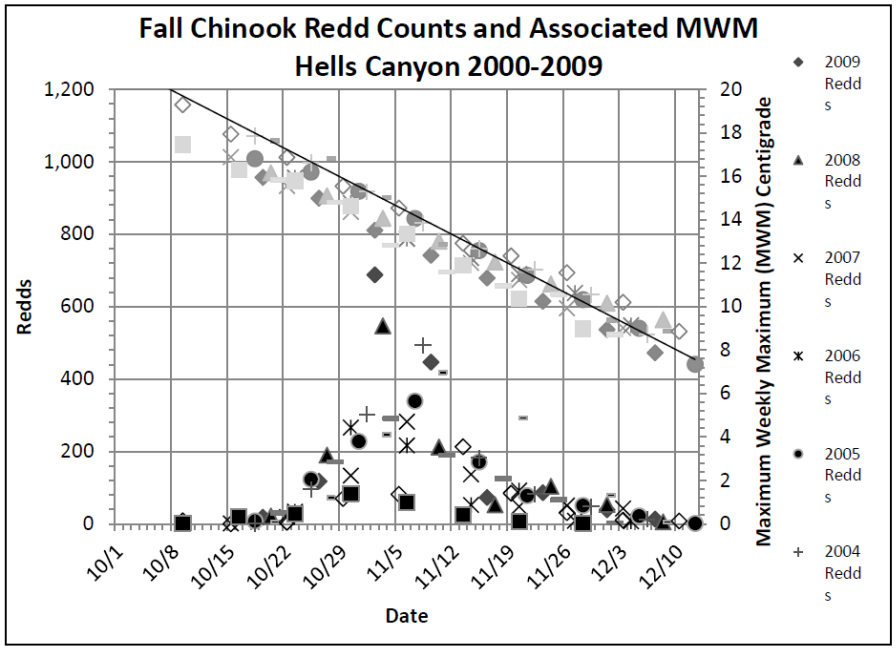



**Figure 5-3.** Snake River fall Chinook salmon ESU redd counts in Hells Canyon in relation to maximum weekly maximum water temperatures.

| | Date | Daily estimates of cumulative (%) redd counts | | | Mean daily temperature |
|---|---|---|---|---|---|
| Interval start date ==> | 10/13/2014 | 2.6% / (13+1) | = | 0.2% | 17.0 |
| | 10/14/2014 | 2.6% / (13+1) + 0.2% | = | 0.4% | 16.6 |
| | 10/15/2014 | 2.6% / (13+1) + 0.4% | = | 0.6% | 16.2 |
| | 10/16/2014 | 2.6% / (13+1) + 0.6% | = | 0.7% | 15.8 |
| | 10/17/2014 | 2.6% / (13+1) + 0.7% | = | 0.9% | 15.6 |
| | 10/18/2014 | 2.6% / (13+1) + 0.9% | = | 1.1% | 15.7 |
| | 10/19/2014 | 2.6% / (13+1) + 1.1% | = | 1.3% | 15.7 |
| | 10/20/2014 | 2.6% / (13+1) + 1.3% | = | 1.5% | 15.6 |
| | 10/21/2014 | 2.6% / (13+1) + 1.5% | = | 1.7% | 15.4 |
| | 10/22/2014 | 2.6% / (13+1) + 1.7% | = | 1.9% | 15.2 |
| | 10/23/2014 | 2.6% / (13+1) + 1.9% | = | 2.0% | 15.0 |
| | 10/24/2014 | 2.6% / (13+1) + 2.0% | = | 2.2% | 14.6 |
| | 10/25/2014 | 2.6% / (13+1) + 2.2% | = | 2.4% | 14.5 |
| Interval end date ==> | 10/26/2014 | From (Table 1) | | 2.6% | 14.1 |

# Level of Protection: NOAA's Fall Chinook Recovery Plan (November 2017), Temperature Impacts and Summary

- "Currently, roughly 10 to 20 percent of redds are deposited between October 23 and 31, when water temperatures are 14.5 to 16 °C (58 to 61 °F) and within a range where there is still uncertainty regarding whether impacts to egg and fry viability are occurring, and if so, to what degree."

- "…most spawning (about 96 percent of redds counted) in the Upper Hells Canyon reach of the Lower Snake River typically does not occur until temperatures fall below 16.5 °C (61.7 °F) (Groves and Chandler 1999; Groves et al. 2013; Appendix C). Lesser impacts could be occurring to eggs deposited in late October when temperatures are usually 14.5 to 16 °C (58 to 61 °F); there is, however, substantial uncertainty in the literature because very few studies have attempted to measure egg and fry mortality from elevated spawning temperatures in a declining temperature regime."

# NOAA's Fall Chinook Recovery Plan (November 2017), Temperature Summary

Summary: "While the temperatures are not always optimum, and while some Upper Hells Canyon reach spawners may be negatively affected, existing studies specific to Snake River fall Chinook salmon do not point to temperature as a significant limiting factor. Recent high abundance of naturally produced Snake River fall Chinook salmon spawning in the area also suggests that this is not currently one of the more significant limiting factors for the ESU."

# EPA's Biological Evaluation – Species Analyzed

- USFWS: Bull Trout
- NMFS: Snake River Sockeye, Steelhead, Spring/Summer Chinook, Fall-run Chinook, Southern Resident Killer Whale (Orca) (dependent on prey that are present in the Action Area)

# Biological Evaluation- Approach

- Identified whether species are present in the Action Area at the time of year that the SSC applies or are dependent on prey; and different lifestage vulnerabilities
- Baseline
  - Temperatures typically exceed the SSC in the action area
  - Low dissolved oxygen conditions (below ID WQS) at the time of year the criterion applies
- For salmonids, included new literature review and effects to juveniles, subadults (foraging), adults just prior to spawning, and to spawned eggs and fry

# Biological Evaluation - Findings

- The Action is likely to adversely affect fall-run Chinook and critical habitat
  - adverse effects based on quantifying percentage of redds emplaced and potential loss estimates from studies
  - used high-end estimate of 39% of redds emplaced during early spawning period from Connor et al report (2017) and mortality estimates from Olson et al. 1970 and other studies for projected temperatures allowed under the SSC
- The Action is likely to adversely affect Orca
  - adverse effects based on qualitative analysis of likely adverse effects for fall Chinook (prey)
- Essential fish habitat for fall Chinook also likely to be adversely affected
- Other species may effect but not likely to be adversely affected

# Ongoing Environmental/Cumulative Effects and Uncertainty

- Climate Change
- Hells Canyon Complex 401 certification process
- Ongoing environmental baseline impacts – ocean conditions' variability impact to adult salmon population dynamics, implementation of other WQS
- Uncertainty associated with approach of the studies that served as the basis of the submission and qualitative v. quantitative estimates
- Uncertainty associated with redd estimates and interpretation

# Downstream Protection

- Oregon's criterion is 13C as a 7dadm for this time period and extends to the border of ID/OR/WA
- The most sensitive use designated DS in OR waters is the same for this time of year- salmon spawning
- ID will have to implement CWA programs to protect downstream waters

# Next steps

- 4/4/19 – EPA sent a Biological Evaluation to NMFS and FWS to initiate consultation under the Endangered Species Act.
  - ESA consultation allows the Services to opine on the protectiveness of 14.5C
  - Services have 135 days to produce an Opinion
- We will continue communication and to keep the Tribe apprised about this action

# Contact info

- *General coordination* Mary Lou Soscia: soscia.marylou@epa.gov; ph: 503-326-5873
- *Technical info on Site Specific Criterion Action* Rochelle Labiosa: labiosa.rochelle@epa.gov; 206-553-1172
- *Water Quality Standards Manager*: Hanh Shaw, shaw.hanh@epa.gov; 206-553-0171

# Extra slides

# Basis of the currently effective 13C SSC

- IDEQ cited to the salmonid spawning criterion from EPA's Pacific Northwest Temperature Guidance (2003)*
- Oregon and Idaho currently both have 13 SSC
- Guidance looked at lethal and sublethal impacts of temperature on eggs and fry
- Guidance looked at broad array of literature – many river systems, salmonid species, and thermal regimes
  - Continuous temperature experiments and declining temperature experiments. 13C 7dadm recommended as upper end of optimal range.
    - 13C max from constant experiments on egg viability, but identified 14C as upper end of daily average range at which spawning most frequently occurs
  - Published prior to Geist et al. 2006 study

*Available at: https://www.epa.gov/wa/northwest-water-quality-temperature-guidance-salmon-steelhead-and-bull-trout

# Scientific Basis: What information does IDEQ cite to support the revised SSC?

- **Four lines of evidence from laboratory and field observations**
  - "Laboratory studies of temperature on Chinook egg incubation show no sign of effect on incubation success for eggs exposed to the proposed criterion temperatures"
  - "Fall Chinook initiate spawning at temperatures even warmer than the proposed criterion"
  - "Under the current thermal regime…fall Chinook spawning has been improving"
  - "The ramp in temperature the revised site-specific criterion allows for closely mimics the typical fall decline in water temperatures as seasons change"

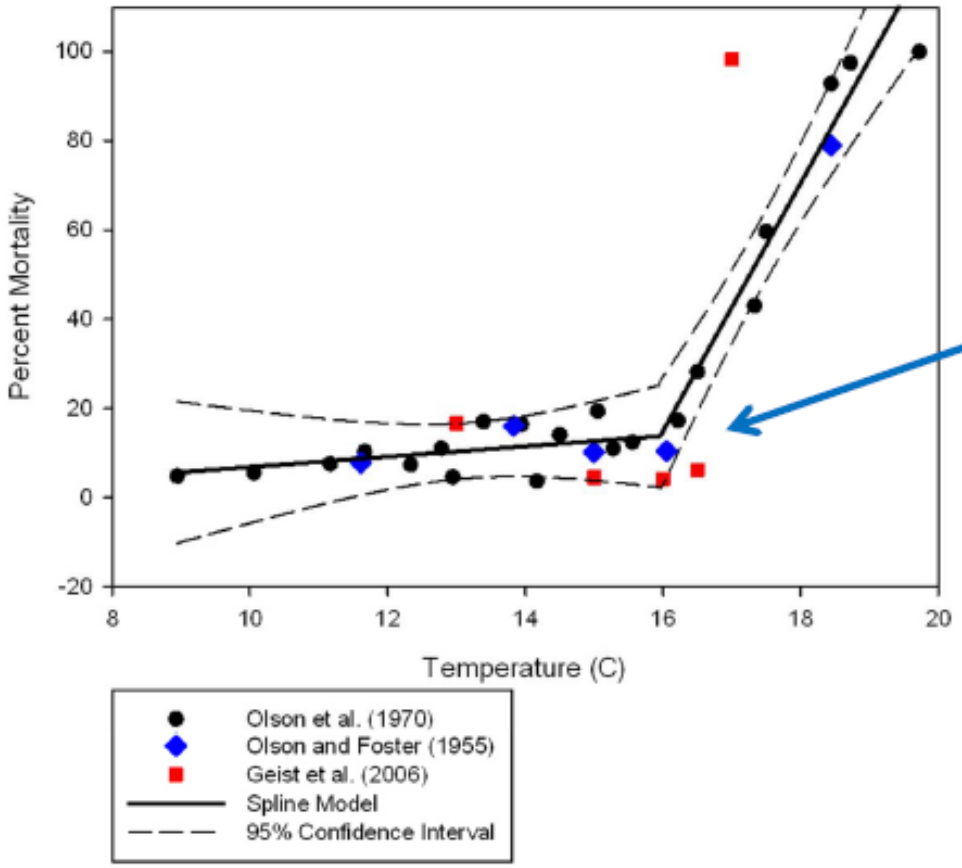
# Scientific Basis for Revised SSC: 3 Studies provided as evidence

- "Three specific studies to fall Chinook salmon initial incubation temperatures":
  - Geist et al. (2006) – SR fall Chinook salmon
  - Olson et al. (1970) – Hanford Reach fall Chinook salmon
  - Olson and Foster (1955) – Hanford Reach fall Chinook salmon
- "All three studies indicated a sharp increase in mortality when a threshold temperature during incubation was exceeded."
  - Geist et al. (2006) reported a temperature threshold value of 16.5°C
  - Olson and Foster (1955) study reported a value of 16.1°C
  - Olson et al. (1970) did not report a threshold value, but yielded a temperature threshold for mortality similar to that found in the Olson and Foster (1955) report.

*All information from the final IPC presentation to the IDEQ Board of Environmental Quality, November 10th, 2011*

# IDEQ/IPC cited laboratory data

## Supporting Science




- **Segmented regression – a spline model.**
  **"join point" – indicates threshold temperature at which mortality begins to increase.**
- **threshold value – 16°C**
- **95% confidence interval ranging from initial daily maximum of 15.3°C to 16.6°C.**
- **An initial daily maximum of 15.3°C under a 0.2 °C daily rate of decline is equal to a Weekly Maximum Temperature (WMT) of 14.7 °C.**

*All information from the final IPC presentation to the IDEQ Board of Environmental Quality, November 10th, 2011*

# 401 Certification- More Details (contact, John Palmer)

- Temperature –
  - Upstream Snake River Stewardship Program establishes targets for restoration (thermal credits)
  - Brownlee drawdown
  - Pump -adaptive management if thermal credits not met
- Mercury
  - USGS and partners study going on now
  - IPC will develop implementation plan
- Dissolved oxygen
  - Aerated turbine runners to be located in Brownlee
  - Upstream projects